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SPECIFICATION <EXCERPT>

[0024] Original image data is divided into blocks consisting of a predetermined number of pixels, that is, blocks of 8 vertical by 8 horizontal pixels for example, and successively inputted into the orthogonal transformation circuit 12 in units of blocks consisting of 64 pixels. When the orthogonal transformation circuit 12 performs orthogonal transformation on the original image data, the original image data is divided into frequency components and transformed such that the majority of them become specific frequency components, more specifically to become low-frequency components, to be outputted as transformed data consisting of 64 orthogonal-transformed coefficients.

[0025] Next, the quantization circuit 14 quantizes the transformed data outputted from the orthogonal transformation circuit 12, and outputs the quantized data.

[0026] The transformed data outputted from the orthogonal transformation circuit 12 is inputted into the quantization circuit 14. The transformed data is quantized in the quantization circuit 14 using a quantization table consisting of the same number of coefficients as those which constitute the transformed data, and outputted as the quantized data consisting of 64 quantized coefficients. In the quantization, to be specific, the 64 coefficients which constitute the transformed data are divided by coefficients in the corresponding quantization table, and then rounded to the nearest integral number.

[0027] Note that image quality and the amount of information of coded data can be set freely by changing a coefficient in the quantization table. More specifically, an increase of the coefficient in the quantization table decreases the quality of the decoded image

as well as the amount of information of the coded data, while a decrease of the coefficient in the quantization table increases the amount of information of the coded data as well as the quality of the decoded image.

[0028] Since human eyesight is not sensitive to high frequency components, as already described, a highly efficient compression on the original data and a reduction in the amount of information can be achieved without any degradation of the image quality or only with a slight degradation that cannot be distinguished by human eyes, by increasing the coefficients in the quantization table corresponding to the coefficients of the high frequency components in the transformed data consisting of the 64 coefficients that has been divided into the frequency components by the orthogonal transformation circuit 12.

[0029] Next, the coding circuit 16 encodes, for example through entropy (average information content) coding, the quantized data outputted from the quantization circuit 14, and outputs the coded data.

[0030] The quantized data outputted from the quantization circuit 14 is inputted into the coding circuit 16. This quantized data is coded using a coding table in the coding circuit 16. Through coding, for example, in the Huffman coding which is one of entropy coding schemes, a predetermined length of code is assigned to the quantized data and the resulting data is outputted as coded data.

[0031] For example, giving comparatively short code length to data having high appearance probability, that is, the low frequency component of the original image data, and giving comparatively long code length to data having low appearance probability, that is, high frequency component of the original image data enable the original image data to be compressed highly efficiently and the amount of information to be reduced. Note that coding circuits with any coding scheme can be used in the block distortion reduction device

10 of the present invention.

[0032] The original image data is coded and compressed highly efficiently by the orthogonal transformation circuit 12, the quantization circuit 14, and the coding circuit 16 as described above. As a result, for example, the data can be transmitted to a remote place in a short period of time, and a large amount of image data can be saved efficiently in an optical disc or a CD.

[0039] An inverse coding circuit, the inverse quantization circuit 20, and the inverse orthogonal transformation circuit 22 described below decode the coded original image data to generate decoded image data, and have functions which are opposite that of the coding circuit 16, the quantization circuit 14, and the orthogonal transformation circuit 12, respectively.

[0040] More specifically, the decoding circuit 18 decodes the coded data outputted from the coding circuit 16 and outputs the decoded data, the inverse quantization circuit 20 performs inverse quantization on the decoded data outputted from the decoding circuit 18 and outputs the inverse-quantized data, and the inverse orthogonal transformation circuit 22 performs inverse orthogonal transformation on the inverse-quantized data outputted from the inverse quantization circuit 20 and outputs the inverse-transformed data.

[0041] The coded data outputted from the coding circuit 16 is inputted into the decoding circuit 18. The coded data is decoded in the decoding circuit 18 using the same coding table as the coding circuit 16, and outputted as decoded data consisting of 64 coefficients. Note that the decoded data is the same as the data before the coding, that is, the quantized data.

[0042] Subsequently, the decoded data outputted from the

decoding circuit 18 is inputted into the inverse quantization circuit 20. The inverse quantization circuit 20 performs inverse quantization on the decoded data using the same quantization table as the quantization circuit 14, and outputs inverse-quantized data consisting of 64 coefficients.

[0043] Then, the inverse-quantized data outputted from the inverse quantization circuit 20 is inputted into the inverse orthogonal transformation circuit 22. The inverse orthogonal transformation circuit 22 performs inverse orthogonal transformation on the inverse-quantized data, and outputs inverse-transformed data consisting of 64 coefficients.